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Direct Translation

#### DESCRIPTION

#### SELF AUTOMATIC HAIR AND SCALP WASHING AND CARING DEVICE

##### Technical Field

[0001] The present invention relates to a self automatic hair and scalp washing and caring device, which allows a user to automatically wash his/her hair and take care of his/her scalp by himself/herself at any time and at any place, such as a Japanese cubicle, a western cubicle, a bedroom, or a corridor, because it is not necessary to use facilities for water supply and drainage or power supply facilities or to construct them. In addition, the device can be freely moved by the user by himself/herself to any predetermined place of use because it is made compact by reducing its size and weight.

##### Background Art

[0002] Thus far, at beauty parlors, hair salons, and barber shops, barbers and hairdressers wash the hair of customers while they are seated or operate installed hair treatment devices/machines or the like. In both cases, professionals use their hands to wash the hair or to perform treatment on the hair or scalp.

[0003] The aforementioned related devices/machines are

developed, designed, and manufactured for, for example, beauty parlors and hair salons. Therefore, these devices/machines are of a type that is substantially not designed for being moved (or that are designed so that they can be moved slightly horizontally when, for example, their places of installation at the beauty parlors and hair salons are changed) or are of a fixed type. Consequently, these devices/machines are installed by being carried in and on the assumption that water supply and drainage pipes and power supplies are installed. If they are not installed, piping work and electrical wiring must be carried out (refer to, for example, Patent Documents 1 and 2).

**[0004]** It is widely publicly known that there are many people who have hair problems (such as young people who have lost some of their hair or who have thin hair). Thus, beauty parlors and hair salons have tried to solve such problems by taking care of the hair of such people or by using artificial hair and wigs made of artificial hair. However, there have actually been very few cases in which such people were satisfied with the results.

**[0005]** In particular, it is expensive to have one's hair or scalp taken care of at, for example, beauty parlors and hair salons. Therefore, if a person goes to beauty parlors or hair salons frequently (such as every other day), this becomes a considerable economic burden on the person. As a

result, such a person cannot have his/her hair or scalp taken care of with patience and persistence by, for example, hair restoration.

[0006] For a person who cannot, for example, take a bath or wash his/her hair by himself/herself because he/she is handicapped, even if the body of such a person can be placed in the bath or can be wiped and washed with a steamed towel by the help of another person (such as a care giver), the hair of such a person must also be washed by the help of the another person because the person's hair cannot be washed with a towel. In this case, even if the hair of the person who cannot wash his/her hair by himself/herself is washed every other day, not only is it very difficult to wash this person's hair, but also costs are increased. Therefore, practically speaking, it is impossible to wash such a person's hair.

Patent Document 1: Japanese Unexamined Patent Application  
Publication No. 2003-275019

Patent Document 2: Japanese Patent No. 3278287

Disclosure of Invention

Problems to be Solved by the Invention

[0007] It is an object of the present invention to provide a self automatic hair and scalp washing and caring device, which allows a person to, for example, automatically and freely wash his/her in various ways (including that

described above), take care of his/her hair, take care of his/her scalp, and treat his/her hair by himself/herself without the help or assistance of another person at any time and at any location, such as a place where plumbing and a power supply facility are not provided, and which can be freely moved or transported to a predetermined place of use by the person by himself/herself as a result of making the device compact by reducing the size and weight of the device.

#### Means for Solving the Problems

[0008] To this end, a first structure of a self automatic hair and scalp washing and caring device according to the present invention comprises a human body support comprising a seat surface and a tiltable backrest surface and supporting a person lying face up, a shampoo bowl disposed below the head of the person lying face up at the support and comprising waste-water discharging means, a face cover disposed on the shampoo bowl so as to be openable and closable, removable, or integrated with the shampoo bowl, the face cover and the shampoo bowl covering the head of the person lying face up, and supplying means, disposed at the shampoo bowl or the cover, for supplying liquid including chemical liquid and washing liquid to the head surrounded by the shampoo bowl and the cover, the chemical liquid including sol and gel shampoo and scalp care agent, the washing liquid including water and hot water. The human

body support, the shampoo bowl, and the face cover are mounted to a frame, so that the size and the weight of the device are such as to allow one person to carry the device.

**[0009]** To this end, a second structure of a self automatic hair and scalp washing and caring device according to the present invention comprises a human body support for supporting at least the upper part of the body of a person tilted forward and lying face down, a shampoo bowl disposed below the head of the person supported at the support and comprising waste-water discharging means, a head cover disposed on the shampoo bowl so as to be openable and closable, or removable, the head cover and the shampoo bowl covering the head of the supported person together, and supplying means, disposed at the shampoo bowl or the head cover, for supplying liquid including chemical liquid and washing liquid to the head surrounded by the shampoo bowl and the head cover, the chemical liquid including sol and gel shampoo and scalp care agent, the washing liquid including water and hot water. The human body support, the shampoo bowl, and the head cover are mounted to a frame, so that the size and the weight of the device are such as to allow one person to carry the device.

**[0010]** A third structure of a self automatic hair and scalp washing and caring device comprises a shampoo bowl disposed below the head of a person who is supported while

lying face up or face down and comprising waste-water discharging means, a face cover or a head cover disposed on the shampoo bowl so as to be openable and closable, removable, or integrated with the shampoo bowl, the face cover or the head cover and the shampoo bowl covering the head together, and supplying means, disposed at the shampoo bowl or the cover, for supplying liquid including chemical liquid and washing liquid to the head surrounded by the shampoo bowl and the cover, the chemical liquid including sol and gel shampoo and scalp care agent, the washing liquid including water and hot water. The shampoo bowl, the face cover or the head cover, and the supplying means are mounted to a frame, so that the size and the weight of the device are such as to allow one person to carry the device, and are used in combination with human body supporting means including a chair for supporting the person lying either face up or down when the device is used.

**[0011]** The frame for mounting the shampoo bowl and the face cover or the head cover or these components and the human body support thereto is any one of a fixed frame, a folding/spreading frame, and a disassembly/reassembly frame. Forming the frame by using, for example, a light metal pipe material or channel material, such as aluminum alloy, greatly contributes to reducing the weight of the device of the present invention.

[0012] In the device of the present invention, the means for supplying various liquids comprises chemical fluid tanks containing chemical fluid including shampoo and scalp care agent, and a washing liquid tank containing liquid including water and hot water. It is desirable that the tanks be movably disposed below the shampoo bowl.

[0013] In the device of the present invention, the liquid that accumulates in the shampoo bowl as a result of connection to the shampoo bowl is passed through and is cleaned at at least one filter or stage or desirably at at least two filters or stages and then is either accumulated in a different tank or circulated in the washing liquid tank. Alternatively, the liquid may be discharged as it is to an existing drainage system.

[0014] In order to supply, for example, a chemical liquid and a washing liquid or to discharge, for example, the washing liquid after use in any of the devices of the present invention having the above-described structures, a suitable type of pump is used. The pump may use either an AC or a DC power source. However, considering the usability of the pump, it is desirable to use an AC/DC power source for selectively switching between AC and DC.

#### Advantages of the Invention

[0015] According to the present invention, it is possible to provide a self automatic hair and scalp washing and

caring device comprising a human body support for supporting a person lying face up, a shampoo bowl which is disposed below the head of the person lying face up at the support, which has a diameter that is greater than the external shape of the head, and which comprises waste-water discharging means, a face cover disposed on the shampoo bowl so as to be openable and closable, removable, or integrated with the shampoo bowl, the face cover and the shampoo bowl together covering the head of the person lying face up, and supplying means, disposed at the shampoo bowl or the face cover, for supplying liquid including chemical liquid and washing liquid to the head surrounded by the shampoo bowl and the face cover, the chemical liquid including sol and gel shampoo and scalp care agent, the washing liquid including water and hot water. The human body support, the shampoo bowl, and the face cover are mounted to a frame, so that the size and the weight of the device are such as to allow one person to carry the device. Therefore, compared to, for example, related business hair washing devices, the self automatic hair and scalp washing and caring device of the present invention is small and light, so that a user can transport and move the device by himself/herself. Consequently, the user can easily move the device of the present invention by himself/herself to at any desired location, such as a Japanese cubicle, a western cubicle, a



bedroom, or a corridor, and use it there.

[0016] Forming chemical liquid supplying and discharging systems and washing water supplying and discharging systems into the form of a circulation loop in the device of the present invention makes it possible to use the device at a place where a water supply line and a drainage facility are not provided.

[0017] In the device of the present invention, a suitable type of pump is used in the systems for supplying, for example, a chemical liquid and a washing liquid and the system for discharging any liquid in the shampoo bowl. Examples of usable pump drive sources are commercial power supplies, ordinary batteries, wind power generators, photovoltaic generators, fuel batteries, and solar batteries. By using the pump which may be driven by either an AC power supply or a DC power supply as described above, the device of the present invention can be used even in a place which does not have any power supply facility.

Best Mode for Carrying Out the Invention

[0018] A self automatic hair and scalp washing and caring device of an embodiment of the present invention will be described with reference to the drawings. Fig. 1 is a partial sectional schematic side view of a device of the present invention, illustrating a state of assembly of the device when the device is used. Fig. 2 is a left side view

(front view) of Fig. 1. Fig. 3 is a right side view (back view) of Fig. 1. Fig. 4 is a plan view of Fig. 1. Fig. 5 is a side view of the device of the present invention shown in Fig. 1 in a folded and accommodated state. Fig. 6 is a schematic side view showing a state of the device of the present invention when a shampoo bowl and a face cover are used. Fig. 7 is a plan view of the state shown in Fig. 6. Fig. 8 is a block diagram of systems for supplying and discharging chemical liquids and a washing liquid in the device of the present invention.

**[0019]** The entire structure of the device of the embodiment of the present invention will be described with reference to Figs. 1 to 5. In Figs. 1 to 5, reference numeral 1 denotes a base frame which supports a seat surface 2 at the upper portion thereof. The illustrated base frame 1 comprises front and back legs 1a and 1b, a lower beam 1c at which the legs 1a and 1b are disposed in a standing manner at the front portion thereof, and an upper beam 1d on which the seat surface 2 is placed. The legs 1a and 1b are formed of, for example, a light metal pipe material or channel material such as aluminum alloy. In the present invention, the form of the base plate 1 is not only limited to that shown in the figures. It may take any form as long as it can hold the seat surface 2 at a height of approximately 40 cm to 50 cm from the floor. In addition,

in the present invention, the frame material is not only limited to aluminum alloy, so that the base frame 1 may be formed of, for example, a steel pipe material or channel material, plastic, wood, or various synthetic materials.

[0020] Reference numeral 3 denotes a backrest surface. At the rear end of the seat surface 2 (that is, at the right side in Fig. 1), the backrest surface 3 is disposed at the parts including the upper beam 1d and the leg 1b (disposed below and at the rear portion of the seat surface 2) so that any inclination angle is selectable and so that the backrest surface 3 can be fixed at the selected inclination angle with respect to the seat surface 2. The seat surface 2 and the backrest surface 3 constitute a human body support. Therefore, the seat surface 2 and the backrest surface 3 may be a seat surface and a backrest surface of an existing reclining chair. As the human body support for supporting the shoulders of a person lying face down, in addition to using an ordinary chair-like support having a backrest, although not shown, a member for supporting the chest of a person sitting on a seat surface and the seat surface may be disposed at the members 1a to 1d of the base frame 1.

[0021] Reference numeral 4 denotes legs that are disposed in a standing manner at a rear end 1e of the lower beam 1c, so that the legs 4 can be raised and lowered. In the embodiment shown in Fig. 1, the lower ends of the legs 4 are

disposed so that supporting parallel links 4a and 4b that are pivotally attached at P1 and P2 at the rear end 1e of the lower beam 1c are supported by a cylinder 4c for, for example, gas pressure or oil pressure and can be positioned upright and lowered towards the leg 1b. Symbols 1f denote movement castors that are disposed at the front and back portion of the lower beam 1c of the base frame 1, and the movement castors 1f are desirably of a type having stoppers or a type having adjustors. Symbols 1g denote side frames serving as armrests disposed at the outer left and right sides of the seat surface 2, and the side frames 1g may be used as handles for movement. In the present invention, the handles specially provided for movement may be, for example, a folding type.

[0022] Reference numeral 5 denotes an upper frame that is disposed at the upper ends of the legs 4 so as to pivotally attached at P3 and P4 towards the back of the base plate 1. A shampoo bowl 6 (described later) and a face cover 7 for covering and uncovering the shampoo bowl 6 are disposed at the upper frame 5.

[0023] As shown in Fig. 8, two chemical liquid tanks 8 and 8', a washing liquid tank 9, and supplying systems 10 to 12 for supplying respective chemical liquids and washing liquid are disposed below the frame 5 and the shampoo bowl 6. These parts are not shown in Figs. 1 to 5. The chemical

tanks 8 and 8' contain chemical liquids, such as shampoo and rinse for washing one's hair and taking care of one's scalp. The washing liquid tank 9 contains hot water or water for washing and rinsing. The supplying systems 10 to 12 include, for example, a pump 16 and tubes that are disposed between the tanks 8, 8', and 9 and the face cover 7. A waste-water discharging system 14 including a waste-water discharging tank 13 is disposed at a discharge opening 6c of the shampoo bowl 6. The structures of the supplying systems 10 to 12 and the waste-water discharging system 14 as well as the shampoo bowl 6 will be described later with reference to Fig. 8.

[0024] Although the shampoo bowl 6 is ordinarily molded out of an opaque synthetic resin (or plastic), the material of the shampoo bowl 6 may be arbitrarily selected in the present invention. The shampoo bowl 6 has a pillow 6a, a recess 6e, and the discharge opening 6c. The pillow 6a is disposed towards the front in the shampoo bowl 6 and supports a person who is going to receive automatic care with the device of the present invention from the occipital region of the head to the neck. The recess 6e is disposed at a wall in front of the pillow 6a and can receive the neck of the person. The discharge opening 6c has a primary filter 6b for connection to the waste-water discharging system 12 disposed therein and is disposed towards the rear

end of the bottom surface of the shampoo bowl 6. A casing 7c for accommodating, for example, the pump 16 (described later) is disposed at the frame 5 under the bowl 6.

[0025] The face cover 7, which is like a cap that can be opened and closed as shown in Fig. 6 by attaching it to an end (right end in Fig. 1) of the illustrated shampoo bowl 6 by a hinge 6d, is mounted to the illustrated shampoo bowl 6. The face cover 7 is desirably molded out of transparent plastic, but the material thereof may be arbitrarily selected. A recess 7d for exposing the face is formed in the front wall of the face cover 7 so as to oppose the recess 6e of the bowl 6 for receiving the neck. At least one shower head 7a is disposed in the face cover 7. The shower head 7a is an example of a discharge head for supplying, for example, a scalp or hair care chemical liquid in the form of a shower or mist towards a head mH of a person lying face up at the support comprising the seat surface 2 and the backrest surface 3. Instead of the shower head 7a, a spray nozzle or a pipe or a tube for discharging water or the like as it is may be used for the discharge head in the device of the present invention. It is desirable that the discharge head that is used be capable of supplying, for example, a washing liquid or a care chemical liquid in the form of, for example, stream currents, showers, or mist when necessary by adjusting an ejecting unit as well

as the shower head 7a. As illustrated in Figs. 6 and 7, it is desirable to provide a removable or a fixed screen 7e for preventing, for example, a washing liquid or a care chemical liquid emitted towards the head from the shower head 7a (discharge head) from flying towards and entering, for example, the eyes or ears of a person who is washing or taking care of his/her hair by himself/herself. The screen 7e is formed of, for example, a plate-shaped, a curtain-shaped, or a panel-shaped material that can shield the entire head of a person including the ears, that is, from the forehead directly above the eyes to the ears, from the shower head 7a. It is desirable that the screen be formed in various sizes in accordance with the size and shape of the person's head or be made to order for each individual.

**[0026]** The discharge head, such as the shower head 7a, may be disposed at the shampoo bowl 6, and may be selectively mounted in either a fixed or a movable manner at its mounting position. When the discharge head is mounted in a movable manner, it can, for example, move vertically or horizontally, swing, oscillate, or rotate. In Fig. 8, symbol 7b denotes a drive unit of the discharge head that comprises an eccentric shaft and a geared motor for rotating the shower head 7a. In the present invention, when the discharge head is of a fixed type, it may be, for example, of a type that is not removed or of a type that can be

removed like a cassette. It is possible to form part of the face cover 7 into a chamber having a shower-head-like ejecting unit and connecting to this chamber tubes of the systems for supplying, for example, respective chemical liquids and washing liquid.

[0027] In the device of the present invention, although not shown, a container that is like a fish bowl may be mounted instead of the shampoo bowl 6 and the face cover 7 described above. The container has a substantially spherical shape and is an integrated structure of a shampoo bowl and a face cover from the beginning. The shampoo bowl has an opening in the front portion for receiving a person's head.

[0028] In the embodiment, the discharge head, such as the shower head 7a in the face cover 7, may be inserted into the face cover 7 from outside the face cover 7 via a hole that is previously formed for the discharge head in the face cover 7.

[0029] As shown in Fig. 8, the shampoo bowl 6, the discharge head, such as the shower head 7a, the chemical liquid tank 8 containing a scalp care chemical liquid agent or a hair care chemical liquid agent, the tank 9 containing washing (rinsing) water or hot water, the waste-water discharging tank 13 are disposed in the care chemical liquid supplying system 10, the washing liquid supplying system 11,



and the waste-water discharging system 14 by soft tubes in which a flow path switching valve 15, the pump 16, a flow amount adjusting valve 17, and a heater flow path 18 are inserted. Reference numeral 19 denotes a cock for switching the flow path of care chemical liquids and washing liquid. The chemical liquid tanks 8 and 8' contain respective scalp care chemical agent and shampoo. Although in the embodiment shown in Fig. 8 they replace the tube of the supplying system 10, they may be connected to the tube of the supplying system 10 via a flow path switching cock C that is indicated by a dotted line in Fig. 8. In addition, in the present invention, a path extending from the chemical liquid tank 8 to the discharge head, such as the shower head 7a, and a path extending from the washing liquid tank 9 to a different discharge head (not shown) may be formed as separate paths without using the switching cock 19.

**[0030]** The first primary filter 6b and secondary and tertiary filters 61b and 62b are connected by a tube 14a between the discharge opening 6c of the shampoo bowl 6 and the switching valve 15. If necessary, it is possible to form the waste-water discharging system 14 by providing a pump (not shown) and directly connecting it to the waste-water discharging tank 13.

**[0031]** In addition to the flow path switching valve 15, the motor-driven switching cock 19 is inserted in the flow

paths of the care chemical liquid system 10 and washing liquid supplying system 11 and performs a switching operation in synchronism with the flow path switching valve 15. A motor-driven switching cock 20 is inserted in a tube 14b in the waste-water discharging system 14 and following the flow path switching valve 15, and can be switched so that chemical liquid or washing liquid discharged from the shampoo bowl 6 and flowing down to the tube 14b via the switching valve 15 either circulates in the chemical liquid tank 8 or is guided to the waste-water discharging tank 13. A switching cock 21 is inserted in a tube 14c following the switching cock 20, and can be switched so that water discharged from the shampoo bowl 6 is either guided to the waste-water discharging tank 13 or to an external discharging system. The flow path switching valve 15 and the switching cocks 20 and 21 carry out the switching operations in synchronism by being driven by a motor. Here, the switching cock 21 is operated by hand.

**[0032]** As shown in Fig. 8, the flow path switching valve 15, the pump 16, the flow amount adjusting valve 17, the heater flow path 18, and the three switching cocks 19 to 21 are connected to a controller 23 including a power supply 22 and their driving is controlled by the controller 23. Reference numeral 23a denotes an operation panel unit disposed at a panel of the controller, and reference numeral

24 denotes a remote control operation panel (hereafter referred to as the "remote controller 24") attached to the controller 23 via a cord 24a. Even if a discharge pump (not shown) is used independently of the waste-water discharging system 14, the pump is connected to the controller 23 in order to control the driving of the pump. Although not shown, it is possible to provide the face cover 7 with a dryer and connect the dryer to the controller 23 in order to control the driving of the dryer.

[0033] Although the above-described device of the present invention is of the type in which the human-body support is disposed on the base frame 1 along with the shampoo bowl 6, the face cover 7 or head cover, etc., it may be of a simple type in which, for example, an existing reclining chair, a chair having a backrest, or a stool is used as the human-body support and in which the shampoo bowl 6, the face cover 7, the chemical liquid supply system, the washing water supplying system, the discharging system, and the additional means 8 to 24 of the supplying and discharging systems are mounted to the base frame 1. The simple type allows a person to automatically wash his/her hair and take care of his/her scalp in the shampoo bowl 6 and the cover 7 by himself/herself while sitting on the chair or stool. The base frame of the device of the simple type may be a fixed type, a folding/spreading type, or a disassembly/reassembly

type.

[0034] An example of a use of the self automatic hair and scalp washing and caring device of the present invention, which has the above-described structure, will be described below.

As shown in Fig. 1, when the device of the present invention is folded when it is not used, the legs 4 and the frame 5 above that have the shampoo bowl 6 and the face cover 7 placed thereon are folded below the backrest surface 3. The folded state is achieved by contracting the cylinder 4c. Therefore, in order to set the device in a state when it is used from the folded state (see Fig. 1), the legs 4 and the upper frame 5 above are raised and the cylinder 4c is extended so as to supplement the raising operation, so that the parts 4 to 7 are positioned as shown in Fig. 1. When the device is folded or spread, the backrest surface 3 is set at an angle that does not interfere with the movement of each of the parts 4 to 7.

[0035] When the device of the present invention is spread as in Fig. 1, any person who opens the face cover 7 and wants to take care of his/her hair or scalp in fully automatic mode by himself/herself places his/her body on the seat surface 2 and the backrest surface 3 while lying face up, and adjusts his/her head mH at a suitable location of the shampoo bowl 6 by himself/herself. The person adjusts

his/her head from the feel that the person gets from the occipital region of the head to the neck when this portion of the person contacts the pillow 6a. The person who is lying face up can hold the remote controller 24 in his/her hand and operate it any time.

[0036] By this, when the device is in a stand-by state for allowing the person to wash or take care of his/her hair or scalp by himself/herself in the fully automatic mode, the face cover 7 is closed and the remote controller 24 is operated in order for the person to wash his/her hair in the fully automatic mode by himself/herself through the steps of, for example, preliminary washing, actual washing, and rinsing. The person can take care of his/her scalp in the way by substantially the same operations. Although not shown, it is possible to mount a small CCD camera and a liquid crystal screen to a suitable part, such as the frame, in order allow the person to view himself/herself washing or taking care of his/her hair or scalp in the fully automatic mode by himself/herself by turning the screen towards himself/herself.

[0037] When the person finishes the fully automatic self care operations with the device of the present invention in the above-described way, the person turns on the dryer and dries his/her head and scalp by the dry air from the nozzle of the dryer. When the hair and the scalp are dried, the

person opens the face cover 7, raises his/her body, moves away from the automatic device of the present invention, disposes of the liquid in the tank 13 of the waste-water discharging system 14, and replenishes the chemical liquid tanks 8 and 9 in order to prepare the device for its next use. Then, the legs 4 are lowered in the direction in which the cylinder 4c is contracted in order to fold the device of the present invention as indicated by a chain line shown in Fig. 1.

**[0038]** The automatic caring device of the present invention in the folded state has, for example, a height of approximately 50 to 65 cm, a width of approximately 50 cm, a length of approximately 100 cm, and a weight of approximately 25 kg to not more than 33 kg. Therefore, the device can be carried by even one adult. Since the device can be loaded into and unloaded from a vehicle, a person can bring the device to the location where he/she wants to use it by himself/herself and it used there.

#### Industrial Applicability

**[0039]** The present invention is as described above, and provides a self automatic hair and scalp washing and caring device comprising a human body support for supporting a person lying face up, a shampoo bowl disposed below the head of the person lying face up at the support and comprising waste-water discharging means, a face cover disposed on the

shampoo bowl so as to be openable and closable, removable, or integrated with the shampoo bowl, the face cover and the shampoo bowl covering the head of the person lying face up, and supplying means, disposed at the shampoo bowl or the cover, for supplying liquid including chemical liquid and washing liquid to the head surrounded by the shampoo bowl and the face cover, the chemical liquid including sol and gel shampoo and scalp care agent, the washing liquid including water and hot water. The human body support, the shampoo bowl, the face cover, and the supplying means are mounted to a frame, so that the size and the weight of the device are such as to allow one person to carry the device. The frame is any one of a folding/spreading frame and a disassembly/reassembly frame. Therefore, compared to, for example, business hair washing devices, the automatic washing and caring device for hair and scalp the present invention is small and light.

**[0040]** The device of the present invention allows a person to automatically wash his/her hair or take care of scalp by himself/herself at any time and at any place, such as a Japanese cubicle, a western cubicle, a bedroom, or a corridor because it is not necessary to use facilities for water supply and drainage or power supply facilities or to construct them. In addition, the device can be made compact by reducing its size and weight, and, thus, can be freely

moved by the user by himself/herself to any predetermined place of use. Therefore, the user can freely wash and take care of his/her hair and scalp in fully automatic mode by himself/herself. The device of the present invention is very effective in making it possible for a user who cannot, for example, wash his/her hair because he/she is physically handicapped to automatically wash his/her hair.

#### Brief Description of the Drawings

**[0041]** Fig. 1 is a partial sectional schematic side view of a device of the present invention, illustrating a state of assembly of the device when the device is used.

Fig. 2 is a left side view (front view) of Fig. 1.

Fig. 3 is a right side view (back view) of Fig. 1.

Fig. 4 is a plan view of Fig. 1.

Fig. 5 is a side view of the device of the present invention shown in Fig. 1 in a folded and accommodated state.

Fig. 6 is a schematic side view showing a state of the device of the present invention when a shampoo bowl and a face cover are used.

Fig. 7 is a plan view of the state shown in Fig. 6.

Fig. 8 is a block diagram of systems for supplying and discharging chemical liquids and a washing liquid in the device of the present invention.

#### Reference Numerals

**[0042]** 1: base frame



1a, 1b: legs  
1c: lower beam  
1d: upper beam  
1e: rear end of lower beam  
2: seat surface  
3: backrest surface  
4: leg  
4a, 4b: parallel links  
4c: cylinder  
5: upper frame  
6: shampoo bowl  
7: face cover  
8: chemical liquid tank  
9: washing liquid tank  
10, 11, 12: supplying systems  
13: waste-water discharging tank  
14: waste-water discharging system  
14a to 14c: discharge system tubes  
15: flow path switching valve  
16: pump  
17: flow amount adjusting valve  
18: heater flow path  
19 to 21: flow path switching cocks  
22: power supply  
23: operation controller

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24: remote control board (remote controller)

mH: head